



INSTRUCTIONS MANUAL FOR THE FLOMID MC/T FLOW METER

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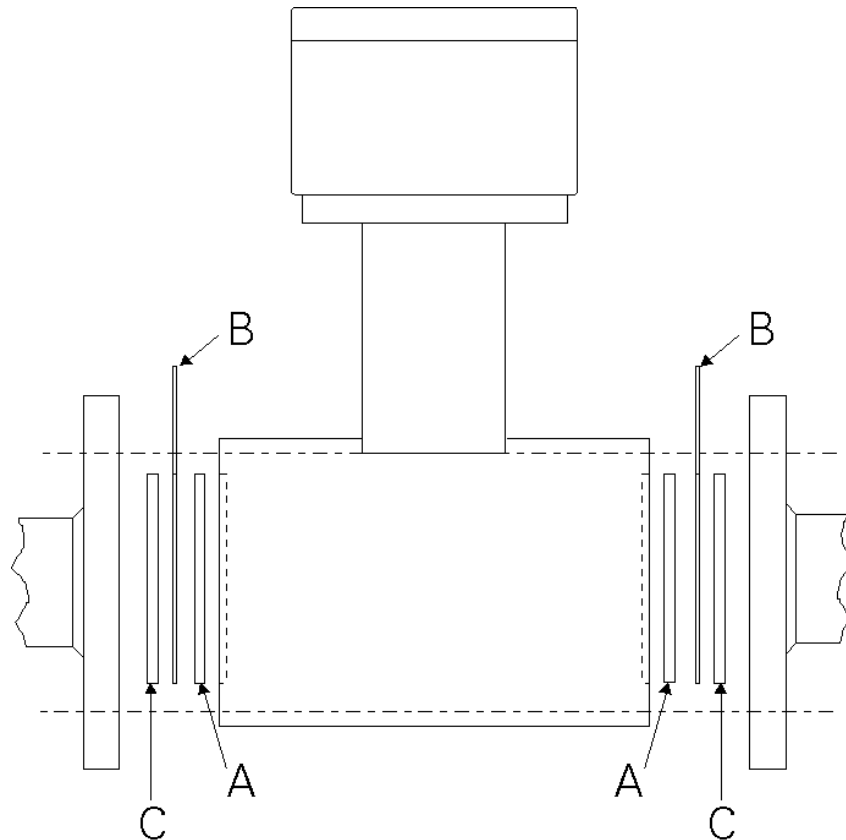
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1 INTRODUCTION

The Flomid-T is an electromagnetic flowmeter based on microprocessor technology. The instrument has a microcontroller, which controls the analog signal from the electrodes, to generate a signal proportional to flow rate. This analogue signal is then converted to a pulse output signal and an analog output signal (4 - 20 mA).

2 INSTALLATION INSTRUCTIONS

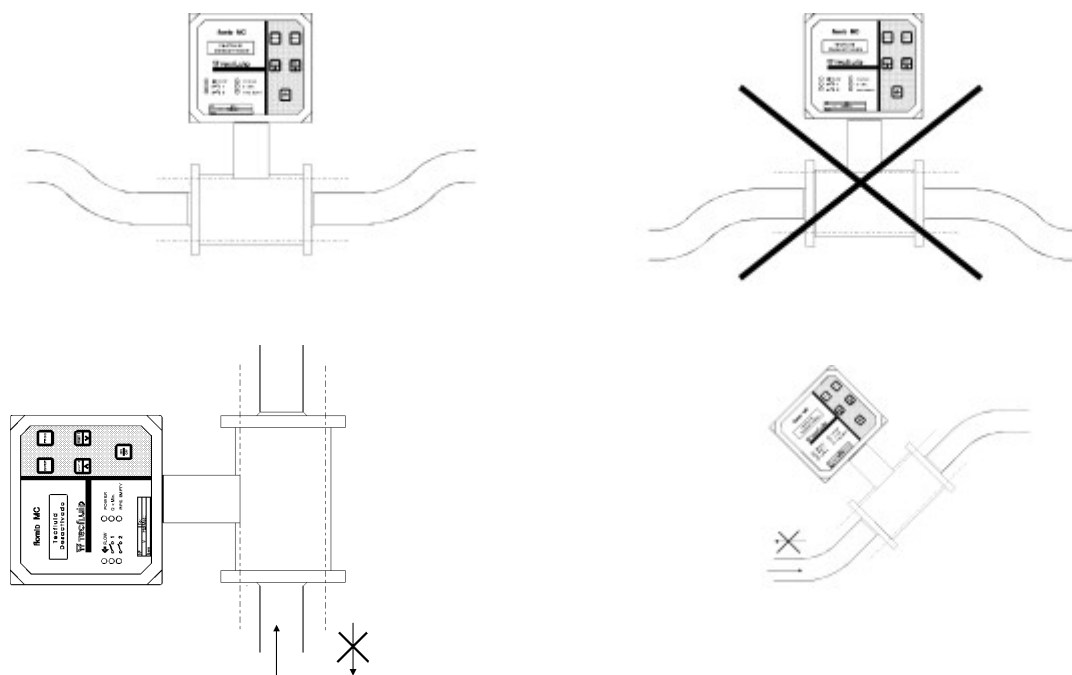
2.1 Installation of the sensor



To guarantee the correct working of the instrument the following precautions must be taken when installing the equipment in the pipe.

- A good earth connection between the measuring body and the liquid can be considered as the most important factor for correct working of the unit. In the event that the pipe is made of electrically conductive material, just connect the two earth wires to the pipe flanges, one to each side of the instrument body. If the pipe is plastic (or any other non-conductive material) two earth discs (B) and two more rubber washers (C), one on each side of the body, must be installed and the earth wires connected to the earth discs. **This earth should be only used for the measuring body, do not connect other equipment to it** since electrical interferences may cause problems.

- To avoid liquid getting into the body of the instrument, make sure that the rubber washers (A) fit inside the steel ring and are only pressured against the plastic body. If the rubber washer only seals against the steel part then liquid can be forced into the body, causing irreparable damage.
- Liquid should always fill the metering tube and cover the electrodes which are in the side of the body. To obtain the best results it is recommended to install the instrument on a rising pipe, which guarantees that the pipe will always be full at the electrodes, avoiding accumulation of bubbles, which can cause incorrect readings.



2.2 Electrical installation

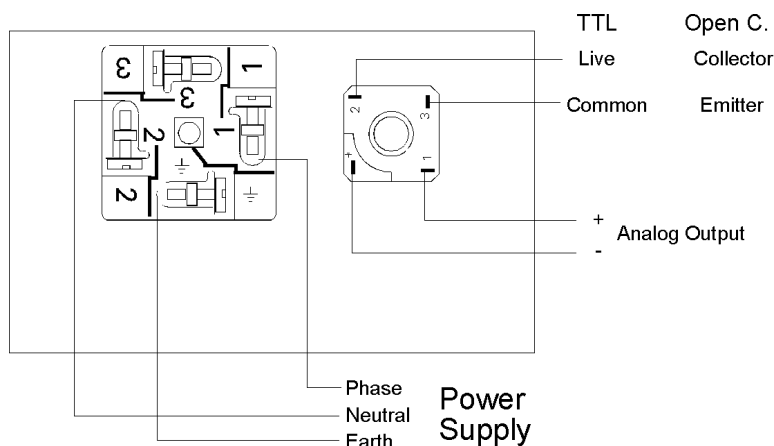
For the electrical installation it is recommended to use multiple conductor cables with individual cable sections in the order of 1 mm². The Flomid-T has two IP-65 connectors at the rear of the electronics housing. The larger of the connectors is for the power supply (mains voltage) and the smaller of the two connectors is for the pulse output.

Before starting the installation, check that the cables to be used are the right size for the cable glands on the connectors, this will guarantee the instrument will stay water tight.

Before starting to install the equipment, check that the supply voltage available is the same as marked on the electronics housing of the instrument.

IMPORTANT: In order to comply with the electrical safety requirements as per IEC 1010-1, the installation of the equipment must take into account the following:

- A mains switch must be provided to disconnect the equipment. This switch must be marked as the disconnecting device for the equipment and be within easy reach of the operator.
- The mains supply must have an earth line.



2.3 Mains supply wiring

The mains supply is wired to terminals 1 & 2 of the largest of the two connectors. The Phase is wired to terminal N° 1, the neutral to terminal N° 2 and the mains earth to the terminal marked as such. The mains earth is important for the line filter inside the instrument and for electrical safety. These connections are by means of screw terminals

2.4 Pulse output wiring

For the pulse output, two types of circuits are available to adapt to different requirements. The type of pulse output is selected by means of two jumpers (J7 and J8) inside the electronics housing.

The connections are by means of solder terminals on the small connector.

Firstly there is a TTL output which gives active pulses from 0 to 5 Volts. The minimum load resistance for this output is 10 k Ω , given that the output resistance of the circuit is 1 k Ω . For this output the live should be connected to terminal N° 3 and the common to terminal N° 2. To select this type of output the jumpers should be across pins 2 and 3 (towards the middle of the PCB) of J7 and J8.

The TTL output is not isolated from the electrodes etc.

Apart from the TTL output there is also an opto- isolated open collector output. This output is an NPN transistor with the collector connected to terminal N° 3 and the emitter connected to terminal N° 2. This output can support 20 mA maximum current and 30 Volts maximum voltage. It is potential free and does not have any protection of any kind, which must be provided externally as needed. To select this type of output the jumpers on J7 and J8 must be across pins 1 and 2 (towards the outside of the PCB)

The pulse output is factory adjusted to give a 1000 Hz output at the nominal maximum flow rate Q_{max} . This output can be changed to 100 Hz at Q_{max} by means of the jumper on J6 (situated at the middle of the PCB near J7 & J8). For a 1000 Hz output the jumper should be across pins 1 and 2 (towards the outside of the PCB) and for a 100 Hz output the jumper should be across pins 2 and 3 (towards the centre of the PCB).

Unless specified otherwise by the client, the instrument is supplied with a 1000 Hz TTL pulse output.

2.5 Analog output wiring

The analog output is on the small connector. Terminal 1 is the positive of the output and the terminal marked as earth is the negative of the output.

The mA output is an active output, which means that the receiver instrument connected to it should have a passive input. It is recommended that the receiver should have an input resistance of less than 800 ohms to guarantee the full scale output.

In the event that the analog output is a voltage output instead of a current output the same connections are made. For the voltage output the load resistance should be greater than 10 K Ω . To change from a current output to a voltage output, jumpers inside the instrument must be changed. This should not be done by unauthorized persons because any changes made will require readjustment of the analog output circuit; the type of output is set at factory as per the clients instructions.

The standard analog output option is for 4 - 20 mA.

3 OPERATION

The Flomid T needs no set up for operation. It is factory adjusted to give a pulse output in Hz and an analog output as indicated on the electronic's housing as per the clients instructions.

The flow direction is from left to right for the standard setting (indicated on the label "Flow : +") This setting can be changed by means of a jumper (J1) inside the instrument. For a reverse flow direction (indicated on the label "Flow : -") the jumper should be across the two pins towards the outside connectors and for a normal flow direction (indicated on the label "Flow : +") the jumper should be on the other side. The equipment is delivered with a normal flow direction (indicated on the label "Flow : +") selected.

If the wrong flow direction is selected then there will be no output in the presence of flow. If the equipment gives no output then check that the flow direction selected is correct.

The pulse output and analog output have a cutoff level at about 2% of the maximum rated flow rate (at 0.1 m/s velocity in the pipe).

4 CHARACTERISTICS

4.1 Power supply

- Supply voltage:

Standard	:	220 Vac 50/60 Hz	
On order	:	240 Vac, 110 Vac, 24 Vac	50/60 Hz
- Power consumption : Menor que 10 VA
- Fuse : 250 mA slow (T) 5 x 20 mm

NOTE: In the cases that the mains frequency is 60 Hz, this should be specified in the clients order since this implies a small change in the program of the microcomputers in order to minimize the effects of electrical noise from power lines.

4.2 Pulse outputs

- TTL (0-5 V)
 - Minimum impedance : 10 K Ω
- Opto-isolated
 - Maximum current : 20 mA
 - Maximum voltage : 30 V

4.3 Analog output

- Current output options : 0 - 20 mA
: 4 - 20 mA
- Voltage output options : 0 - 10 V
: 0 - 5 V
: 2 - 10 V
: 1 - 5 V

4.4 General characteristics

- Environment Protection : IP-65
- Maximum working temperature : 60°C

WARRANTY

Tecfluid S.A. GUARANTEES ALL ITS PRODUCTS FOR A PERIOD OF 12 MONTHS, maximum 18 months after consignment, against all defects in materials and workmanship.

This warranty does not cover failures which can be imputed to misuse, use in an application different to that specified in the order, the result of service or modification by un-authorized persons, bad handling or accident.

This warranty is limited to cover the repair or replacement defective parts which have not been damaged by misuse.

This warranty is limited to the repair of the equipment and all further and eventually following damages are not covered by this warranty.

In the event of consignment of equipment to our factory, this should be done with the equipment well packed and prepaid transport. Tecfluid S.A. will not accept any responsibility for damage done during transport. Together with the equipment, a note should be enclosed indicating the failure observed, the name, address and telephone number of the sender.

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